A Comparison of Suicide Completers with Psychatrically Disordered and Non-Disordered Subjects Via the Psychological Autopsy Method

Thomas M. Kelly, Ph.D.
Ph.D., University of Pittsburgh School of Social Work 1996
Post Doctoral Fellow, Pittsburgh Adolescent Research Center

Statement of the Research Problem

Suicide is a relatively rare cause of death, officially accounting for 30,232 deaths in 1989. This is a low base rate compared to the leading cause of death, heart disease, which killed 733,867 in the same year. Still, suicide has increased over the past 40 years, climbing from twelfth place to its current position as the eighth leading cause of death in the United States and the second leading cause of death for white males in the 15-24 age group (Monthly Vital Statistics Report, Jan., 1992). The low base rate associated with suicide represents an outcome event which is difficult to study.

Prospective studies of outcome phenomenon with low base rates such as completed suicide are time-consuming, labor intensive and expensive (Clark & Horton-Deutsch, 1992). They involve longitudinal studies of those considered at risk for suicide, identified from clinical (treated) populations. Furthermore, the low base rate associated with suicide contributes to small sample sizes in such studies. As a result of these limitations, the findings are less generalizable to the general population.

An alternative method exists in the psychological autopsy study which employs knowledgeable informants to conduct a retrospective examination of psychosocial risk factors in a person's life that may have contributed to the their death. A Coroner's sample improves on both of the above sample limitations because a larger number of subjects, which is more representative of the general population, can be found in a shorter time frame.

While limitations associated with the study of suicide have precluded a definitive profile of the suicide completer, significant progress has been made in identifying commonly found risk factors. These include age, or specifically, aging. Although youth suicide has risen dramatically over the past 20 years, those over age 65 have always had the highest base rate, i.e. approximately 21 per 100,00 (McIntosh, 1992). Gender and race are also highly relevant factors since 70% of all suicides in the United States are of white males (Maris, 1992). White females comprise the next largest group (about 22%) but the prevalence rate among black males is twice that of white females (11.6 vs. 5.7 per 100,000) (Garrison, 1992). Marriage appears to be protective in that the relative risk of suicide in widowed and divorced males is 3-4 times higher than the married in most age groups (Buda & Tsuang, 1990).

While the interaction effect of risk factors is paramount in assessing suicidality, psychiatric disorder is often considered the number one risk factor for completed suicide. Particularly major depression, schizophrenia (Tanney, 1992); psychotic thinking (Miller & Chabrier, 1987) and alcoholism (Roy & Linnoilla, 1986) have been linked to suicide. Alcoholism in conjunction with impulsive and/or antisocial behavior has also been associated with completed suicide (Frances, Fyer, & Clarkin, 1986; Maris, 1992). In line with this aggression, as a personality trait, figures prominently in suicide. Recent research in this area has found that the neurotransmitter, serotonin, may moderate the relationship between aggression and suicide (Golden, Gilmore, Corrigan, Ekstrom, Knight & Garbutt, 1991). The availability of a highly lethal means, i.e. firearms, has also been consistently correlated with suicide (Brent, Perper, Goldstein, Kolko, Allan, Allman et al., 1988; Kellerman, Rivara, Somes, Reay, Francisco, Banton et al., 1992; Sloan, Rivara, Reay, Ferris, Path & Kellerman, 1990).

Finally, variables related to family functioning i.e. family discord (Adam, 1990) and family history of suicidal behavior (Egeland & Sussex, 1985; Murphy & Wetzel, 1982, Schulsinger, Kety, Rosenthal & Wender, 1979) have been found associated with suicide. The current study employs a large data set of these demographic, psychiatric and psychosocial variables to determine risk factors for completed suicide. Those who completed suicide are compared to two other groups who died other manners of death, one determined to have at least one psychiatric disorder at time of death and one without psychiatric disorder at time of death.

Research Questions

Based on the above, the following research questions were formulated: 1) What, if any, psychiatric differences exist between those who died by suicide and those who died other manners of death? 2) Do suicide completers differ from those who died other manners of death on risk factors such as aggression, availability of firearms and family history of psychopathology and suicide? 3) Are there definable clusters of risk factors for suicide that result in suicidal subtypes?

Specifically, it was hypothesized that suicide completers would be more likely diagnosed with major depression, schizophrenia, and delusional thinking than the psychiatric disordered who died other manners of death. Similarly, it was also expected that suicide completers would be more likely diagnosed with alcoholism and a comorbid Axis II Cluster B personality disorder (Borderline, Antisocial, Narcissistic or Histrionic) than the psychiatrically disordered who died other manners of death. Suicide completers were also expected to rate higher on aggression than both the other comparison groups and more likely to have access to firearms than those who died other manners of death. Finally, it was expected that the biological family members of suicide completers would have made more suicide attempts than

the relatives of the combined comparison groups and that suicide completers would be more likely to have biological relatives who were diagnosed with a psychiatric disorder than the non-disordered comparison group.

Methodology

The current study is one component of a larger project entitled "Premature Deaths in Adults" which was carried out at the University of Pittsburgh Medical Center between 1990 and 1994. The method is a retrospective examination of factors associated with death using the psychological autopsy method (Shneidman & Farberow, 1961; Brent, 1989) in a consecutive series of subjects who were referred by the Allegheny County Coroner's Office, Pittsburgh, Pennsylvania and whose family and friends consented to be interviewed.

Approximately three months after the death the next of kin received a letter introducing them to the research and notifying them that they would be contacted by telephone regarding a potential appointment. One week later a telephone call was placed to fully describe the study and arrange an appointment. Potential informants were apprised that participation was voluntary and were given the option of being seen in their home or the interviewer's office. All interested close family and friends were invited in an attempt to ensure that at least two informants were available.

Most interviews included all informants at one session but some cases required more than one session and participation varied by some informants, when multiple sessions were required. The primary informant, e.g. spouse, mother etc. was present at each session. The interviews ranged in length from 90 minutes to six hours. The informants were evaluated for normal bereavement versus psychopathology (e.g. major depression, post traumatic stress disorder) to judge their need for education and emotional support or referral for formal treatment. Next-of-kin were also asked to sign a release of information to obtain psychiatric records on those with a history of treatment. Three informants refused this request. Written records were obtained in most cases but some telephone interviews were conducted with health care providers to obtain clinical information.

All interviews were conducted by the author who was not blind to manner of death, resulting in a potential case evaluation bias. Psychiatric diagnoses were determined in case conferences which included a board certified psychiatrist and a research psychologist to minimize this bias. A study was also conducted to determine the reliability and validity of the psychiatric diagnosis made on the basis of the research interview.

Fifty-five decedents (58%) in the sample had received psychiatric treatment in their life. Medical records were acquired on 40 (73%) of those with a history of treatment, including 18 (50%) of the suicide completers and 22 (37%) of those who died by other causes. All available records were independently reviewed by a research psychiatrist who was blind to

manner of death to confirm the Axis I or Axis II primary diagnosis made while the decedent was in treatment. These diagnoses were then used in a comparison with clinical diagnoses made by the research interviewer based on the psychological autopsy information. The research interviewer remained blind to the clinical information contained in the medical record.

The kappa statistic was used for the comparison analysis because it accounts for agreements that may occur by chance (Bartko & Carpenter, 1976). The kappa coefficient for agreement on the Axis I, primary diagnosis was .75, $p < .0001$ while that for agreement on Axis II was .64, $p < .0001$. These results compare favorably with other, direct patient interview reliability studies of psychiatric diagnosis (First, Spitzer, Gibbon, Williams, Davies, Borus et al., 1995; Williams, Gibbon, First, Spitzer, Davies, Borus et al., 1992).

While the foregoing analysis confirms reliability with respect to agreement between raters, a related development is that the method for assigning psychiatric diagnosis is also upheld. Therefore, this study establishes the convergent validity of the current research method with that used by clinicians in the community. Axis I psychiatric diagnosis was made via the Structured Clinical Interview for DSM-III-R Disorders - Patient Edition (Spitzer, Williams, Gibbon & First, 1992). The SCID-P is a semi-structured instrument which is administered by a clinician to determine the presence/absence of psychiatric disorders defined by the Diagnostic and Statistical Manual, 3rd Edition, Revised (DSM-III-R) of the American Psychiatric Association (1987). The Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II) (First, Spitzer, Gibbon & Williams, 1995) was used to assess the decedent for Axis II personality disorders. The SCID-II allows for the diagnosis of 12 specific personality disorders and the mixed type, designated as Not Otherwise Specified (PD NOS).

The patient/demographic history instrument was developed at the Mental Health Clinic Research Center for the Study of Suicidal Behavior, Cornell University Medical College. It was refined at the University of Pittsburgh, Western Psychiatric Institute and Clinic, Clinical Research Center for the Study of Suicidal Behavior and was used to record demographic data, history of physical/psychiatric illness and treatment, a developmental/educational history, and a history of psychiatric disorders and suicidal behavior in the decedent's blood relatives.

The instrument to study patients' aggression history is a modified version of the Brown-Goodwin (Brown, Goodwin, Ballenger, Goyer & Major, 1979) aggression history. It contains 10 items that measure aggression on a four point continuum (1=never to 4=often), resulting in a maximum score of 40. The circumstances of death scale (Brent, unpublished) was used to record date, time and manner of death. The exposure to suicide and firearm report (Brent, unpublished) provides information on the decedent's exposure to suicidal behavior by family, friends, or acquaintances and also assesses the availability of firearms to the individual. It allows for the recording of whether there were firearms in the home, who owned them, and how they were stored (locked/ unlocked; loaded/unloaded).

Family psychiatric history was considered by means of a modified version of the Family History Interview - Research Diagnostic Criteria developed by Endicott, Andreason & Spitzer (1975). Information supplied by knowledgeable informants, i.e. close family members, was used to determine the presence/absence of psychiatric illness in the decedent's biological relatives. The current version was modified to assess for DSM-III-R defined psychiatric disorders.

The sample consists of 162 decedents referred by the Allegheny County Coroner's Office, Pittsburgh, Pennsylvania, after manner of death had been established. This included 57 subjects who died by suicide, 61 who died by natural causes, 35 accident victims and 9 homicides. Informants in the study include the family and friends of the deceased. Seventeen of the deceaseds' next of kin could not be located. Of the remaining 145, 50 families refused to participate. Ninety-five psychological autopsies were carried out on 36 suicides and 59 deaths by other causes, representing a 66% participation rate for those approached (suicides= 67%; others=64%).

Comparison of those who participated (n=95) with those who refused (n=50) and those who could not be located (n=17) for age, gender, race and marital status revealed significant differences on the race variable ($Chi^2=12.71$, $p<.01$) and marital status ($Chi^2=6.92$, $p<.05$). The three comparison groups include: (1) suicide completers (n=36); those with Axis I and/or Axis II psychiatric disorder at time of death who died by other causes (n=41) and (3) those with no Axis I/Axis II psychiatric disorder at time of death who died by other causes (n=18).

Prior to hypothesis testing, the three groups were tested for differences on age, race, gender, marital and socioeconomic status. Statistically significant differences were found between the groups on age, gender and socioeconomic status. Therefore, these variables were entered as control variables in all subsequent hypothesis tests. All hypotheses were tested with forward step logistic regression analysis except for part one of hypothesis three, higher levels of aggression will be found among the suicide completers than in the psychiatrically disordered and non-disordered groups. Analysis of covariance (ANCOVA) was used to test this hypothesis. The logistic regression models included the independent variable and control variables and the likelihood ratio (LR) was used to determine statistically significant variables remaining in the model at the final step. Variables remaining in the model at or below the .05 alpha level are considered statistically significant. However, those at or below the .10 level are reported as trend levels of significance and considered artifacts of the sampling procedure or suggestive of findings that may have attained statistical significance in a larger sample. A cluster analysis of the suicide completers was also conducted to determine if sub-types exist within this group.

Results

The results of the logistic regression analysis support the hypothesis that major depression is more prevalent among the suicide completers than the psychiatrically disordered who died other manners of death. At the final step the depression variable was the only one to remain in the model (-2 Log LR=36.25, df=1, $p<.0001$).

There was no support for the hypothesis that higher rates of schizophrenia would be found in the suicide completer group than among those with psychiatric disorder who died other manners of death. At the final step only the gender variable remained in the logistic regression model at trend level of significance (-2 Log LR=2.74, df=1, $p<.10$), suggesting that females were somewhat more likely to die by suicide. This is consistent with the findings in the demographic analyses of the comparing the suicide completers with those who died other manners of death.

Higher rates of delusions were found among the suicide completers at time of death than the psychiatrically disordered who died other manners of death. The delusion variable was the only variable which remained in the model at the final step of the logistic regression (-2 Log LR=8.75, df=1, $p<.005$)

Tenuous support was found for the hypothesis that higher rates of comorbid alcoholism and Cluster B Axis II personality disorders would be found among the suicide completers than those with psychiatric disorder who died other manners of death. At the final step, the comorbidity variable remained at a trend level of significance (-2Log LR=2.74, df=1, $p<.10$) and the gender variable remained (-2 Log LR=4.00, df=1, $p<.05$). A further review of the data indicated that all decedents coded with the comorbidity variable were male alcoholics who received an Axis II diagnosis of antisocial personality disorder (n=11). Thus, while females in this sample are more likely to die by suicide than the psychiatrically disordered who died other manners of death, males diagnosed with alcoholism and a cluster B, Axis II personality disorder were somewhat more likely to die by suicide than any other manner of death.

A trend was also found to suggest that suicide completers (n=36) had greater access to firearms than the combined comparison groups (n=39). At the final step in the logistic regression the firearm availability, age and gender variables remained in the model at trend levels of statistical significance (firearm, -2 Log LR=3.41, df=1, $p<.10$; age, -2 Log LR=3.14, df=1, $p<.10$; gender, -2 Log LR=3.34, df=1, $p<.10$). As indicated, females were somewhat more likely to die by suicide and, in this sample, were more likely to be younger.

Contrary to expectation, comparison of the suicide completer group with the comparison groups revealed that both the psychiatrically disordered group and the suicide completers scored relatively high on aggression (M=21.71, SD=6.06; M=20.33, SD=7.19

respectively) compared to the non-disordered group (M=16.22, SD=4.04). Results of the ANCOVA indicate that age impacts aggression scores in the three groups (B=-.29, S.E.=.04, t=-2.85, p<.01). After adjusting for the effect of age, mean aggression scores for the three groups were not significantly different (psychiatrically disordered M=20.70; suicide completers M=19.56; non-disordered M=18.00).

Findings from the logistic regression analysis did not support either hypotheses related to family history of suicide attempts and psychopathology in biological relatives. Age and gender remained in the model at the final step (age, -2 Log LR=4.29, df=1, p<.05; gender, -2 Log LR=4.63, df=1, p<.05) indicating that suicide completers are younger than the combined disordered and non-disordered groups and that females in the sample are more likely to die by suicide. In the testing of the suicide completers with the non-disordered group on relatives diagnosed with psychopathology, all control variables remained in the model at the final step (age, -2 Log LR=9.07, df=1, p<.005; gender, -2 Log LR=5.54, df=1, p<.05; ses, -2 Log LR=3.59, df=1, p<.10) suggesting that suicide completers are younger, more likely to be female and somewhat more likely to be of lower socioeconomic status.

A cluster analysis of the suicide completers found three groups with distinct characteristics: 1) a "previously treated, cognitively disordered" group (n=10) with an age range of 24-60; all had made previous attempts and 80% were delusional at time of death 2) "a young male, highly aggressive" group (n=15) with an age range of 17-42, most of whom had made no prior attempts and never received treatment and 3) "an older, non-aggressive" group (n=10, age 28-78); most had never been treated and only 2 (20%) had made any previous suicide attempts.

These results must be considered in the context of the design limitations. First, the method is retrospective and involves significant loss. Therefore problems associated with the informants' bereavement and memory may have affected the quality of the data. Further, although an effort has been made to demonstrate the validity of the psychological autopsy method by a study of the diagnostic method and an effort was made to include more than one informant for each case, the design is less than optimal since it excludes the actual subject of research. Second, the relatively small sample affects the weight that can be assigned to the findings. The caution associated with acceptance of trends in the data has already been addressed. Finally, although as noted, a Coroner's sample is taken from the general population, the parameters associated with remanding bodies to a Coroner's office and the particular geographic area of the study affects the generalizability of these findings.

Utility for Social Work Practice

The above limitations notwithstanding, the results of this study generally support previous findings regarding risk factors for completed suicide. Evaluation of suicide risk requires specialized knowledge. However, studies (Ishii, 1985; Rich, Young & Fowler, 1986;

Robins, 1981) indicate that most of those who complete suicide never receive psychiatric care. While some people complete suicide impulsively and, therefore, do not come to the attention of any helping professional, many others are seen somewhere in the educational, social service, religious or health care systems and could be referred for further evaluation of suicide intent.

Social workers perform many roles within these systems. There are likely more subspecialties in the field of social work than within any other non-medical, helping profession. Therefore, more than any other helping professional group (with the exception of general practice physicians), social workers perform roles that bring them into contact with potentially suicidal clients. Therefore, it is imperative that social workers learn to identify risk factors for suicide and understand how they interact to produce suicidal behavior. This is a necessary component of any effort to increase treatment of those at risk for suicide and, thereby, reduce the suicide rate.

References

Adam, K. S. (1990). Environmental, psychosocial and psychoanalytic aspects of suicidal behavior. In Blumenthal S. J. and Kupfer, D. J. (Eds.), Suicide Over the Life Cycle (pp.39-96). Washington D.C.: American Psychiatric Press, Inc.

American Psychiatric Association. (1987). Diagnostic and Statistical Manual of Mental Disorders (3rd ed., rev.). Washington D.C., Author.

Andreason, N. C., Endicott, J., Spitzer, R. L. & Winokur, G. (1977). The family history method using diagnostic criteria. Archives of General Psychiatry, 34, 129-1235.

Bartko, J. J. & Carpenter, W. T., Jr. (1976). On the methods and theory of reliability. The Journal of Nervous and Mental Disease, 163, 307-317.

Brent, D. A., Perper, J. A., Goldstein, C. E., Kolko, D. J., Allan, M. J., Allman, C. J. & Zelenak, J. P. (1988). Archives of General Psychiatry, 45, 581-588.

Brent. D. A. (1989). The psychological autopsy: methodological considerations for the study of adolescent suicide. Suicide and Life Threatening Behavior, 19(1), 43-57.

Brown, G., Goodwin, F., Ballenger, J., Goyer, P. & Major, L. (1979). Aggression in human correlates with cerebrospinal fluid amine metabolites. Psychiatry Research, 1, 131-139.

Buda M. & Tsuang M. T. (1990). The epidemiology of suicide: implications for clinical practice. In S. J. Blumenthal and D. J Kupfer (Eds.), Suicide Over the Life Cycle (pp. 17-38). Washington D. C. : American Psychiatric Press, Inc.

Clark, D. C. & Horton-Deutsch, S. L. (1992). Assessment in Absentia: The value of the psychological autopsy method for studying antecedents of suicide and predicting future suicides. In R. W. Maris, A.L. Berman, J. T. Maltsberger & R. I. Yufit (Eds.), Assessment and Prediction of Suicide (pp. 144-182). New York: The Guilford Press.

Egeland, J. A. & Sussex, J. N. (1985). Suicide and family loading for affective disorders. Journal of the American Medical Association, 254, (7), 915-918.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1995). The structured clinical interview for DSM-III-R personality disorders (SCID-II), part I: description. Journal of Personality Disorders, 9(2), 83-91.

First, M. B., Spitzer, R. L., Gibbon, M., Williams, J. B. W., Davies, M. & Borus, J. et al. (1995). The structured clinical interview for DSM-III-R personality disorders

(SCID-II): Part II: multi-site test-retest reliability study. Journal of Personality Disorders, 9(2), 92-104.

Frances, A., Fyer, M. & Clarkin, J. (1986). Personality and suicide. Annals of the New York Academy of Sciences, 487, 281-293.

Garrison, C. Z. (1992). Demographic predictors of suicide. In R. W. Maris, A. L. Berman, J. T.Maltsberger & R. I. Yufit (Eds.), Assessment and Prediction of Suicide (pp. 484-498). New York: The Guilford Press.

Golden, R. N., Gilmore, J. H., Corrigan, M. H. N., Ekstrom, R. D., Knight, B. T. & Garbutt, J. C. (1991). Serotonin, suicide and aggression: clinical studies. Journal of Clinical Psychiatry, 52(12) (suppl.), 61-69.

Ishii, K. (1985). Background of higher suicide rates among "name university" students: a retrospective study of the past 25 years. Suicide and Life Threatening Behavior, 15, (1),56-68.

Kellerman, A. L., Rivara, F. P., Somes, G., Reay, D. T., Francisco, J., Banton, J. G., Prodzinski, J., Flinger, C. & Hackman, B. B. (1992). Suicide in the home in relation to gun ownership. The New England Journal of Medicine, 327 (7) 467-472.

Maris, R. W. (1992). Overview of the study of suicide assessment and prediction. In R. W. Maris, A. L. Berman, J. T. Maltsberger & R. I. Yufit (Eds.), Assessment and Prediction of Suicide (pp. 3-22). New York: The Guilford Press.

McIntosh, J. L. (1992). Older Adults: the next suicide epidemic? Suicide and Life Threatening Behavior, 22(3), 322-332.

Miller, F. & Chabrier, L. (1987). The relation of delusional content in psychotic depression to life-threatening behavior. Suicide and Life Threatening Behavior, 17(1), 13-17.

Monthly Vital Statistics Report, (1992). Advance report of final mortality statistics, 1989. Center for disease Control, 40(8), Supplement 2.

Murphy, G. E. & Wetzel, R.D. (1982). Family history of suicidal behavior among suicide attempters. The Journal of Nervous and Mental Disease, 170, (2), 86-90.

Rich, C. L., Young, D. & Fowler, R. C. (1986). San Diego suicide study I: young vs. old subjects. Archives of General Psychiatry, 43, 577-582.

Robins, E. (1981). The Final Months. New York and Oxford: Oxford University Press.

Roy, A. & Linnoila, M. (1986). Alcoholism and suicide. In R. W. Maris (Ed.), Biology of Suicide (pp. 162-191). New York: The Guilford Press.

Schulsinger, F., Kety, S. S., Rosenthal, D. & Wender, P. H. (1979). A family study of suicide. In M. Schou and E. Stromgren (Eds.), Origin, Prevention and Treatment of Affective Disorders (pp. 277-287). London: Academic Press.

Shneidman, E. S. & Farberow, N. (1961). Sample investigation of equivocal suicidal deaths. In N. Farberow & E. S. Shneidman (Eds.), The Cry for Help (pp. 118-128). New York: McGraw Hill.

Spitzer, R. L., Williams, J. B. W., Gibbon, M. & First, M. B. (1992). The structured clinical interview for DSM-III-R (SCID) I: history, rationale and description. Archives of General Psychiatry, 49, 624-629.

Tanney, B. (1992). Mental Disorders, psychiatric patients and suicide. In R. W. Maris, A. L.Berman, J. T. Maltsberger & R. I. Yufit (Eds.) Assessment and Prediction of Suicide (pp. 277-320). New York: The Guilford Press.

Williams, J. B. W., Gibbon, M., First, M. B., Spitzer, R., Davies, M. & Borus, J. et al. (1992). The structured clinical interview for DSM-III-R (SCID) II multisite test-retest reliability. Archives of General Psychiatry, 49, 630-636.